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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

# TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

108041-7

U.S. APPLICATION NO. (If known, see 37 CFR 1.5

09/868020

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/IB99/01593

29 September 1999

30 September 1998

## TITLE OF INVENTION

SYSTEM FOR PROGRAMMING A HOUSEHOLD APPLIANCE HAVING AN ELECTRONIC CONTROL

## APPLICANT(S) FOR DO/EO/US

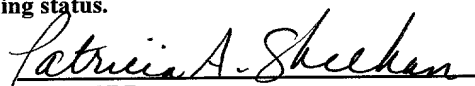
AISA, Valerio

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☐ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☒ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
  - ☒ Petition to Revive
  - ☒ International Preliminary Examination Report
  - ☒ International Search Report
  - ☒ Declaration of Patricia A. Sheehan

U.S. APPLICATION NO. <b>09/868020</b>		INTERNATIONAL APPLICATION NO. <b>PCT/IB99/01593</b>		ATTORNEY'S DOCKET NUMBER <b>108041-0007</b>																															
<b>21. <input checked="" type="checkbox"/> The following fees are submitted:</b> <b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO..... <b>\$1000.00</b>  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... <b>\$860.00</b>  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... <b>\$710.00</b>  International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... <b>\$690.00</b>  International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... <b>\$100.00</b>  <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				<b>CALCULATIONS PTO USE ONLY</b>																															
Surcharge of <b>\$130.00</b> for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				<b>\$860.00</b>																															
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 15%;">CLAIMS</th><th style="width: 20%;">NUMBER FILED</th><th style="width: 20%;">NUMBER EXTRA</th><th style="width: 15%;">RATE</th><th style="width: 15%;">\$</th><th style="width: 15%;"></th></tr></thead><tbody><tr><td>Total claims</td><td><b>36</b> - 20 =</td><td><b>16</b></td><td>x <b>\$18.00</b></td><td><b>\$288.00</b></td><td></td></tr><tr><td>Independent claims</td><td><b>1</b> - 3 =</td><td><b>0</b></td><td>x <b>\$80.00</b></td><td><b>\$</b></td><td></td></tr><tr><td colspan="4">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td><td>+ <b>\$270.00</b></td><td><b>\$</b></td></tr><tr><td colspan="4" style="text-align: right;"><b>TOTAL OF ABOVE CALCULATIONS =</b></td><td><b>\$1278.00</b></td><td></td></tr></tbody></table>				CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$		Total claims	<b>36</b> - 20 =	<b>16</b>	x <b>\$18.00</b>	<b>\$288.00</b>		Independent claims	<b>1</b> - 3 =	<b>0</b>	x <b>\$80.00</b>	<b>\$</b>		MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ <b>\$270.00</b>	<b>\$</b>	<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$1278.00</b>		<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. <span style="float: right;">+</span>	
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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). <b>\$40.00</b> per property <span style="float: right;">+</span>				<b>\$ 40.00</b>																															
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<p>a. <input checked="" type="checkbox"/> A check in the amount of \$ <b>1318.00</b> to cover the above fees is enclosed.</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <b>03-1237</b>. A duplicate copy of this sheet is enclosed.</p> <p>d. <input type="checkbox"/> Fees are to be charged to a credit card. <b>WARNING:</b> Information on this form may become public. <b>Credit card information should not be included on this form.</b> Provide credit card information and authorization on PTO-2038.</p>																																			
<p><b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.</b></p> <div style="display: flex; justify-content: space-between;"><div style="width: 45%;"><p>SEND ALL CORRESPONDENCE TO: <b>Patricia A. Sheehan</b> <b>Cesari and McKenna, LLP</b> <b>88 Black Falcon Avenue</b> <b>Boston, MA 02210</b></p></div><div style="width: 50%; text-align: right;"><div style="text-align: center;"> SIGNATURE</div><div style="text-align: center;"><u><b>Patricia A. Sheehan</b></u> NAME</div><div style="text-align: center;"><u><b>32,301</b></u> REGISTRATION NUMBER</div></div></div>																																			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: )  
Valerio Aisa )  
 )  
International Appl. No. ) Examiner: not yet assigned  
PCT/IB99/01593 )  
 )  
Serial No.: not yet assigned ) Art Unit: not yet assigned  
 )  
International Filing Date: 9/29/99 )  
 )  
Filed: herewith )

For: SYSTEM FOR  
PROGRAMMING A  
HOUSEHOLD APPLIANCE  
HAVING AN ELECTRONIC  
CONTROL

Cesari and McKenna, LLP  
30 Rowes Wharf  
Boston, MA 02110  
June 12, 2001

Honorable Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

**PRELIMINARY AMENDMENT**

Please cancel claims 1-37 and add the following new claims 38-73 as set forth on  
the following pages:

38. A system for controlling the operations of a household appliance, the system including:

- A. a microcontroller for operating the appliance;
- B. a memory accessible by the microcontroller for storing information used by the microcontroller to operate the appliance, the memory storing
  - i. information for controlling the operations of certain components of the household appliance during various operating cycles;
  - ii. one or more predetermined first sets of parameters associated respectively with the operations of the components, the first sets of parameters being associated with a corresponding number of predetermined programs of operation involving the various operating cycles; and
  - iii. one or more second sets of parameters associated respectively with the operations of the components, the second sets of parameters being associated with a corresponding number of additional programs of operation involving the various operating cycles;
- C. communication means for providing from an external source information that specifies the parameters for each of the second sets of parameters; and
- D. a control panel for user selection of the set of parameters for use at a given time,

wherein the microcontroller uses the selected set of parameters to control the operations of the components in the various operating cycles to perform a given predetermined program or additional program.

39. The system of claim 38 wherein the control panel includes the communication means for providing the information that specifies the second sets of parameters.

40. The system of claim 38 wherein the stored information for controlling the operations relate to the general structure of underlying programs of operations that can be

performed by the appliance and to the logic governing the execution of the underlying programs.

41. The system of claim 40 wherein the microcontroller uses the selected set of parameters in conjunction with the underlying programs to operate the appliance in accordance with a predetermined program or an additional program.
42. The system, according to claim 40, wherein each of the predetermined and additional programs is subdivided into various treatment phases, and each phase is in turn characterized by parameters from the sets of parameters.
43. The system, according to claim 40, wherein the sets of parameters include information that controls the duration of each of the phases, temperature values being characteristic of the phases, the configuration and the mode of operation of one or more of the components of the appliance during the phases.
44. The system, according to claim 40, wherein each set of parameters includes information that identifies the associated program.
45. The system, according to claim 38, wherein the control panel includes a display device that displays data that identifies the predetermined and additional programs that can be selected.
46. The system, according to claim 45, wherein the displayed data identifies a program by an order number.
47. The system, according to claim 45, wherein the data identifies a program by a name represented in alphabetical, numerical or graphic characters.
48. The system, according to claim 45, wherein the data identifying a program includes

numerical information, alphabetical or alphanumerical information.

49. The system, according to claim 38, wherein the memory includes a part of a program memory of the microcontroller.

50. The system, according to claim 38, wherein the memory locations containing the information for controlling the operations and the first sets of parameters are locations in ROM.

51. The system, according to claim 38, wherein the locations containing the second sets of parameters are locations in EEPROM.

52. The system, according to claim 39, wherein the communication means for providing information for the second set of parameters includes a serial port.

53. The system, according to claim 38, wherein the communications means for providing information includes an adaptor for connecting the appliance to a network, the adaptor providing communications between the network and the appliance.

54. The system, according to claim 38, wherein the communications means for providing information includes means for

- i. reading one of the first sets of parameters,
- ii. modifying the parameters to produce an associated second set of parameters, and
- iii. providing the associated second set of parameters to the memory to specify an associated additional program.

55. The system, according to claim 54, wherein the communication means for providing

the information includes a memory and the associated second set of parameters is stored therein.

56. The system, according to claim 38, wherein the communications means for providing information includes means for editing a stored second sets of parameters and storing the edited parameters as a new set of second parameters that correspond to a new additional program.

57. The system, according to claim 38, wherein the communication means for providing information includes a display for displaying the parameters in a graphic form.

58. The system, according to claim 38, including in the communication means for providing information a display for displaying information identifying the selected program of the appliance.

59. The system, according to claim 41, wherein the communication means for providing information includes a means for selecting from a given program a phase of interest and displaying at least some of the parameters relating to the selected phase.

60. The system, according to the claim 60, wherein said means displays all the modifiable parameters pertaining to the selected phase.

61. The system, according to claim 59, wherein the communication means further displays a Cartesian plane, which shows, on the abscissa, the duration of the various phases forming a given program, and on the ordinates, another parameter relating to said phases, in particular a temperature value.

62. The system, according to claim 41 wherein the information provided for a given second set of parameters suppresses at least one of the phases into which the associated

additional program is subdivided.

63. The system, according to claim 38, wherein the communication means for providing information is a duly programmed personal computer.

64. The system, according to claim 64, wherein means are provided for executing, under the direct control of the personal computer, one of the additional programs.

65. The system, according to claim 38, further including a control means for avoiding appliance operation in accordance with wrong or faulty programs that lead to unsatisfactory results or performance of the appliance.

66. The system, according to claim 38, wherein the communication means for providing information is a connection to a telephone line for communicating with a remote system through said line.

67. The system, according to claim 66, wherein the connection is a modem and the remote system includes an Internet site.

68. The system, according to claim 66, wherein the means for providing information downloads information from the remote system for storage in the memory as a second set of parameters.

69. The system, according to claim 38, wherein the means for providing information includes a display for displaying in a real time information concerning the progress status of the program being running on said appliance.

70. The system, according to claim 38, wherein the means for providing information



includes means for programming in time the execution of a selected program of the appliance.

71. The system, according to claim 42, wherein the appliance is a household cooking oven.

72. The system, according to claim 42, wherein the appliance is a washing machine.

73. The system, according to claim 72 wherein the communication means for providing information includes means for selecting one or more phases into which an additional cooking program is subdivided, and means for modifying parameters relating to:

- the duration of the selected phase, and/or
- the temperature to be reached inside the oven during the selected phase, and/or
- the configuration and/or operating mode of heat sources for the oven (1), and/or
- the type of ventilation of possible use for the selected phase, and/or
- the modes of a possible use of a grill heater during the selected phase.

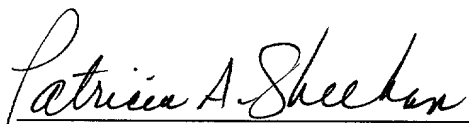
**REMARKS**

Please cancel pending claims 1-37 and include claims 38-73 before examination.

Please charge any additional fee occasioned by this paper to our Deposit Account

No. 03-1237.

Respectfully submitted,

A handwritten signature in cursive script, reading "Patricia A. Sheehan". The signature is written in dark ink and is positioned above a horizontal line.

Patricia A. Sheehan

Reg. No. 32,301

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(617) 951-2500

## SYSTEM FOR PROGRAMMING A HOUSEHOLD APPLIANCE HAVING AN ELECTRONIC CONTROL

### DESCRIPTION

The present invention relates to a system for programming a household appliance having an electronic control, of the type being able to execute a plurality of programs.

As known, a program consists of a set of instructions duly encoded for controlling the execution of operating cycles, which are meant as a group of operations for handling the items submitted to the action of the household appliance; each operating cycle is individually split in handling steps of its own, which are more or less complex, each one of them featured by specific parameters, which are substantially related to times and modes of actuation of specific internal devices of the household appliance (think for instance, for the case of a laundry wash machine, to solenoid valves, motors, heaters, pumps, fans, detergent dispensers, etc.); in some cases, one same program is apt for controlling execution of several sequential operating cycles (think for instance, always in the case of a laundry washing machine, to a wash cycle followed by a drying cycle).

From the above, it appears clear that quite different handling cycles and consequently various programs corresponds to different values of the parameters mentioned above.

As known, household appliances usually provide a certain number of operating programs, which can be selected by the user according to his/her own requirements.

In general, such programs have a substantially rigid structure, which mainly depends upon the experience and capacity acquired in time by the appliance manufacturer, and a minimum degree of discretionary power is left to the user of the appliance in modifying such a structure.

Let us think, for instance, to washing machines which usually have a certain number of standard programs, where only few modifications with the aid of proper control means, such as selectors, push-buttons, etc., can be made by the user, such as setting the washing temperature; the same applies for setting the cooking temperature in household cooking

ovens.

However, in daily practice, it may happen that such limited capabilities of modifying an operating program of the household appliance does not comply with the user's requirements; moreover, the user has no way to permanently store the various  
5 modifications he is frequently making manually to a certain program, so that each time he is forced to make a complete resetting.

Household cooking ovens represent a characteristic example of the rigidity of the basic or standard programs of most household appliances presently available.

According to the known technique, in fact, in the instance of household cooking ovens  
10 neither the simple programming of different temperature profiles within one operating cycle, nor the control of the activation and/or deactivation at preset times of heat sources or ventilation devices or their alternation and/or modification during the program execution are allowed.

As a result, in the instance of complex cooking processes, a household cooking oven  
15 presumes the user's presence and his personal manual activity, right in view of modifying the configuration of the heat sources or the temperature profiles in the time: the user has indeed the opportunity of making such modifications manually, but this obviously requires a high engagement and is complicated.

Let us think, for instance, of baking a roast-beef in an oven, which requires in general an  
20 initial phase with a considerable heat supply followed then by a low fire phase.

The preparation of such a simple dish in a conventional oven does necessarily require the user's presence, for manually changing, at the right time, the temperature and/or the configuration of the heating elements, after the oven has performed the above initial phase.

Obviously, similar problems also arise in household appliances other than cooking ovens.  
25 such as laundry washing machines, dishwashers, refrigerators and in general for any household appliance where a user may wish to obtain specific *ad-hoc* programs, to suit his own requirements.

In an attempt of facilitating from a practical viewpoint the programming of complex

functions, household appliances have been proposed, having an electronic control and proper dialog means, such as displays and keyboards, with the purpose of reducing the user's difficulties through a most interactive programming.

However, such solutions do not allow for generating real new permanent operating  
5 programs, being designed by the user; moreover, said dialog means, which are rather expensive, require the use of electric/electronic devices capable of withstanding the difficult working conditions of the household appliance, leading to a consequent increase in the cost of the latter.

Other solutions are also known, which provide for the use, on-board the household  
10 appliance, of sophisticated systems for a further programming, based on bar-code readers or magnetic cards; such systems, too, if allows for easing the user's life on one hand, will increase the final cost of the appliance to a prohibitive extent on the other hand; moreover, it is not quite sure that the programs configured as bar codes or magnetic cards will fully comply with the user's specific requirements.

15 As it can be noticed, therefore, the household appliances of the above type, though being characterized by a high sophistication level, have an extremely high cost, which tends to limit their diffusion and make them less "user friendly".

Appliances for beverage preparation are also known in an industrial environment, whose electronic control system can be interfaced to an external device, such as a computer; in  
20 this instance, the appliance provides a limited number of standard operative programs having a well defined structure, while the external device is used, when installing the appliance itself, to set some characteristic parameters of said predefined standard programs according to the user's instructions and/or type of beverage to be prepared; the parameters are then permanently stored in the memory means of the appliance control system, until a  
25 new setting of such parameters is necessary.

The above system, which is provided for the initial setup or the periodical setting of the appliance, has the drawback of not allowing a real creation of new operative programs, other than the standard ones, to suit the user's necessities.

Apart from the fact that an industrial appliance for beverage preparation represents a more complex and expensive machine compared to a common household appliance, a solution of the above kind, when referred to a household appliance, would not solve the above problems, save allowing for a durable saving of the parameters most frequently used with reference to the basic programs alone.

Another drawback of the above solution is the limited number of available programs, without any capability of adding new programs to the existing ones.

From EP-A-0 588 107 and EP-A-391 316 systems are known for programming in different way a basic household appliance, during the manufacturing stage of the latter; in this way, it is thus possible to produce several models of a same appliance, the operating programs of which differ depending upon its market of destination.

According to this solutions, the basic household appliance is provided with a control system comprising a microcontroller, memory means, means for interfacing the control system to an external programming device and a control panel, residing on the appliance.

During the manufacturing stage, an external electronic programming device is connected to the control system, for storing within the memory means all the operating programs being specifically intended for the appliance model under production; said programs are then selectable through the control panel, for allowing the immediate use of the appliance, once the latter has been marketed.

It is the object of the present invention to indicate a solution for the above problems, without increasing the cost of the household appliance to a prohibitive extent.

Within this frame, the present invention has the aim of providing a system for programming a household appliance having standardized operating programs, which allows for improving the control system of the appliance itself through the addition, in the time and under specific user's necessities, of durable programs which are designed

according to the user's specific requirements.

Said aim is obtained according to the present invention by a system and a method for programming a household appliance having the characterizing features of the annexed claims 1 and 24; said aim is also attained by a household appliance, for the use in the system according to claim 1, and by a programming user interface, for the use in the method according to claim 24, having the characterizing features of the annexed claims 17 and 31, respectively.

Further embodiments of the system, the method, the appliance and the user interface according to the present invention are then described in the attached dependents claims, which form an integral part of the present description.

Further aims, features and advantages of the present invention will become apparent from the following detailed description and annexed drawings, which are supplied by way of non limiting example, wherein:

- Fig. 1 shows schematically a system for programming a household appliance having an electronic control according to the present invention;
- Fig. 2 shows schematically a possible embodiment of the control system of a household appliance according to the present invention;
- Fig. 3 shows schematically a display device of a household appliance used in the system according to the present invention;
- Fig. 4 shows schematically an example of a video display of a managing program or editor, used in the system according to the present invention.

As mentioned above, the idea at the basis of the present invention is to provide a household appliance having conventional functions, i.e. equipped with common basic programs, which has, however, the peculiar feature of being already prearranged for receiving and retaining new operating programs, which come from outside and are designed according to specific user's requirements; according to the invention, the new operating cycles of the

appliance, and therefore the new programs, are designed and stored in the appliance control system through an external electronic device being programmed to this purpose.

According to the invention, the appliance control system is at least partially of the electronic type and comprises a duly prearranged microcontroller, to which suitable  
5 memory means are associated; a protected part (i.e. which cannot be modified) of the memory means contains the information required for executing the basic or standard operating cycles of the household appliance, whereas a free modifiable part of the memory means is provided for storing new operating cycles which originates the new programs.

The control system can be interfaced with said external electronic device, which has the  
10 aim of allowing the user to create and insert in a simplified mode, within the above said memory means, new operating cycles of the household appliance which originate the new programs; to this purpose, the appliance control system provides for a proper interfacing module, preferably being and of a low cost, which forms an optional component of the appliance itself.

15 On the other hand, the control panel of the household appliance according to the invention has a common appearance and a low cost, and therefore equipped with usual knobs, push-buttons and at least a simplified display device, so that the user may easily use the basic functions and operating cycles of the appliance; according to the invention, said control means are then also used for selecting new operating cycles once they are stored in the  
20 appliance control system and they have originated the new programs.

In Fig. 1, reference 1 indicates schematically a household appliance according to the present invention, which in the give example is a cooking oven.

The oven 1 has a panel 2 containing control and display means, which comprise in particular:

- 25
- a switch 3, for switching the oven on;
  - a selector 4, for the possible manual setting of the internal temperature of the cooking chamber of the oven;
  - a pair of keys 5 (forward - backward), for selecting an operating program of the oven;



- a display 6, for the identification, in a numerical and/or alphabetical and/or graphical way, of the operating programs being available on the oven, and other possible useful information (such as time, fault alarm messages, etc.).

- a key 7, for starting and/or stopping the program selected through buttons 5 and display

5 6;

- a key 8, for enabling the programming and/or the displaying of the time on the display 6.

The oven 1 has an electronic control system, whose structure is shown schematically in Fig. 2. Such a control system comprises an electronic microcontroller MP, being able to interpret the controls inputted through the panel 2 and consequently manage the operation  
10 of the oven 1.

Memory means ME are associated to the microcontroller, at least a part of which is of the electrically writable and erasable type; at least three different memory areas can be identified in the memory means ME of Fig. 2.

In a first area ME1 of the memory means ME, information reside permanently, which  
15 relate to the general structure of the operating cycles of the oven 1, and the logic which governs their execution, or, in other words, the control program of the oven itself and the data relating to the operating cycles which the appliance can perform, consisting in their turn of phases which are characterized by determined operating parameters relating to the internal devices of the appliance.

20 Just by way of example, in the instance of the oven 1, for an operative cycle a subdivision can be provided into an initial preheating phase, followed by three or more cooking phases (in the instance of a laundry washing machine, the program may be split in a prewash cycle, a wash cycle, a rinsing cycle, a spinning and/or drying cycle, each cycle comprising one or more phases).

25 The memory area ME1 is protected, in the sense that the information contained therein cannot be modified by the user; to this purpose, the memory area ME1 preferably consists of a portion of the program memory of the microcontroller MP.

A second area ME2 of the memory means ME is provided for storing the above cited

operating parameters characterizing the various phases into which some specific standard operative cycles of the household appliance are subdivided; in other terms, the groups of parameters being stored in the area ME2 relate to standard operative cycles, and therefore to the basic programs, available on the appliance at the time of its purchase, and which  
5 allow its immediate use.

Such basic programs are those normally executed by a conventional household appliance; therefore, in the instance of an oven apt for the conventional infrared cooking, reference is made to the capability of selecting the cooking program through the controls on the panel 2, choosing a relevant temperature and eventually a cooking time.

10 Also the memory area ME2 is protected, in the sense that its contents cannot be modified by the user; this is due to the consideration that the parameters stored therein refer to the basic functions of the household appliance. Consequently, also the memory area ME2 may consist of a portion of the program memory of the microcontroller MP, or be constituted by a memory of the ROM type.

15 A name is associated to each group of operating parameters stored in ME2, relating to a determined operating cycle, which is preferably expressed in alphabetic and/or numerical and/or graphical characters, allowing for a univocal identification of a determined program of the appliance. Therefore, the basic programs available can be sequentially scrolled on the display 6, by using the keys 5, in order to select the desired one; preferably, the  
20 identifying sign of each program (which is substantially associated to the group of operating parameters characterizing each execution phase of that cooking program) consists of numerical information (program order number) and alphabetic or alphanumerical information (real program name, consisting of a determined number of alphabetic and/or numerical characters describing its function, such as "Static Cooking",  
25 "Ventilated Cooking", "Dual Grill", etc.); on the other hand, nothing hinders the use of a proper graphical symbol as an identifying sign for each program, such as an "icon", eventually associated to a name expressed in alphabetic or alphanumerical characters.

Fig. 3 shows by way of example a possible embodiment of the display 6, such as of the

liquid crystals type, and of the information represented on it; in the upper portion of the display 6 the program number is represented, whereas the lower portion is used for displaying the assigned name, through alphanumerical characters; for example, the upper and lower portion of the display 6 could allow at least a display of five and fourteen alphanumerical characters, respectively.

In the instance of an oven, the parameters contained in the memory area ME2 may concern the phase duration, the temperature inside the cooking chamber, the configuration of the heating elements, the availability or not of ventilation and the mode of operation which the relevant oven actuators (which just manage the heating elements and the fans) must follow during that phase.

Such actuators, which are controlled by the microcontroller MP in function of the selected program and may consist for instance of relays and/or triacs, can be identified in Fig. 2 with the relevant devices (heating elements and fans) managed by them, which are shown schematically with A1, A2, A3, A4 and A5. Practically, such devices may consists of a heater underneath the cooking chamber, a heater behind the cooking chamber, a grill heater inside the cooking chamber, a steam generator, an air circulation fan (in the instance of a washing machine the devices may consist of one or more water heaters, a motor for agitating the drum with determined frequencies, directions and speeds, a heater and/or drying fan, a detergent dispenser, a water level control pressure switch, etc.); obviously, the control system comprises suitable sensor means of the operating conditions of the oven 1 (such as a temperature sensor), not shown in the figures for simplicity's sake.

Finally, a third area ME3 of the memory means ME is provided for receiving the parameters characterizing the various phases into which additional operative cycles of the household appliance are subdivided, which are generated and/or stored therein on user's request, through an electronic device which can be interfaced with the oven 1, and which therefore determines new programs.

Unlike the areas ME1 and ME2, the contents of the memory area ME3 are freely writable, erasable and modifiable according to the user's requirements; to this purpose, the memory

area ME1 preferably consists of an electrically writable and erasable memory, in particular a memory of the EEPROM type.

Obviously, also in this instance, each group of parameters relating to the phases of a specific cycle eventually stored in the area ME3 has an associated name and/or order  
5 number and/or graphic sign, for allowing the univocal identification of the relevant program, as previously described with reference to the contents of the memory area ME2 (for example, "Roastbeef", "Pizza", "Lamb", etc.).

Obviously, the identifying information of each program and therefore of the relevant operating cycle (for a basic program or a new program), are stored in the memory means  
10 ME2 or ME3, respectively.

Then, in other terms, according to the present invention, the oven 1 has initially a sort of "intelligence" residing in the memory areas ME1 and ME2, for obtaining a certain number of basic or standard programs (for example seven); the user has then the opportunity of adding in time the information relating to new programs generated according to the user's  
15 specific requirements or wishes, and storing them in the memory area ME3.

By way of example, the memory area ME3 may be provided for containing the parameters characterizing other thirty-three additional programs (or even more, depending on the size chosen for the memory ME3), which can be inserted in the control system of the household appliance through an external electronic device.

20 To this purpose, the control system of the oven 1 has a proper interface IN (Fig. 1) of a known type, through which the microcontroller is able to communicate with the external world; in the application according to the present invention, any microcontroller MP having an asynchronous serial line can be suitable, so that the interfacing means IN may consist of a simple standard serial port (type EIA - RS232); this solution obviously allow  
25 for interfacing the control system of the oven 1 directly to a Personal Computer, which therefore would represent the above external electronic device, required for generating/storing the new programs of the household appliance.

In a more sophisticated technically embodiment, but surely more practical for the user, the

interface IN may consist of an adapter, in itself known, which allows for connecting the control system of the oven 1 to a "home bus", which uses for instance the same electric mains as the means for the bi-directional data transmission (*power line carrier*), in conformity with the transmission rules being associated to a specific protocol, such as

5 LonWorks of Echelon (USA), or EHS (European Home System), or CEBus (USA), or EIB (Siemens), etc.

Back to Fig. 1, the case is there represented of interfacing the control system of the oven 1 to a generic power line carrier bus, by means of an adapter IN, where the home electric network RE is used as a transmission means.

10 Always in Fig. 1, a Personal Computer indicated with 10 is equipped with a similar adapter IN for its interfacing to the electric network RE; thus, the control system of the oven 1 and the Personal Computer, duly programmed to this purpose, are able to intercommunicate.

To this purpose, according to the present invention, on the Personal Computer 10 a special managing software is present, called "editor" in the following, which provides for at least

15 the following functions:

- possibility of reading, from the memory ME, the operating parameters characterizing the various phases of the operating cycle (or the operating cycles) relating to each basic program of the oven 1, but with no possibility of modifying the contents of the memory area ME2 of the appliance control system; the selection of the parameters to be read by
- 20 the Personal Computer 10 is based on an identifying code assigned to the program;
- possibility of modifying the above parameters characterizing the basic programs of the oven 1; however, only the new values can only be saved in the memory area ME3, by pairing them with an identifying code being different from that assigned to the original basic program residing in the memory area ME2;
- 25 - possibility of editing new cooking programs, i.e. characterized by different values for the operating parameters of the various phases of the operating cycle, even being entirely different from the ones already contained of the memory area ME2 (and eventually also ME3), and of storing them in the memory area ME3 with a new

identifying code (obviously, nothing hinders the user from generating such new programs starting from the programs already possibly contained in ME3).

Preferably, the editor according to the present invention will be supplied free of charge or at a minimum cost for the user purchasing the household appliance, on a suitable magnetic or optical carrier (Floppy Disk or CD ROM) or through telecom network (for example, Internet).

Therefore, as it will be appreciated, in this the possibility is offered of generating real and new operating programs for the household appliance, which may be designed by user according to his specific requirements or habits and saved permanently in the control system of the appliance, where they may be retained for an unlimited time or until a likely subsequent modification or cancellation by the user takes place.

Concerning the specific function of generating new programs, the editor provided according to the present invention allows for selecting, within the frame of each phase of an operating cycle, the relevant characteristic parameters, which in the instance of the oven 1 may refer, as said, to the phase duration, the desired temperature in the cooking chamber, the type of ventilation (if desired), the type of heat sources to be used and their activation modes. Obviously, these are just a few examples relating to an oven, and in no ways limiting examples.

The above parameters are displayed on the video of the Personal Computer, preferably in a graphic mode as schematically represented in Fig. 4, where a possible video display of the editor is shown by way of example.

Four zones can be substantially identified in this figure, for the displaying and inputting of data, and precisely:

- a first zone indicated with I, being dedicated to the selection of various editor options;
- a second zone indicated with II, identifying the appliance program being currently displayed/edited;
- a third zone indicated with III, being dedicated to the selection of the phase of interest out of the phases into which the relevant operating cycle of the appliance is subdivided,

and to the displaying of some parameters relating to such phases;

- a fourth zone indicated with IV, being dedicated to the complete displaying and modification of the parameters of the phase (selected in the zone III) of the program (identified in the zone II).

5 As it can be seen, the zone I consists of a *tool bar*, such as typically used in a Windows® environment, and therefore having "scroll down" menus. In the example being represented in the figure, the menus "File", "Edit" and "Help" are provided. In particular, by means of the menu "File", which is highlighted, options may be selected, such as:

- creating a new program for the oven 1 (option "New");
- 10 - opening an existing program (option "Open"), residing in the memory area ME2 or ME3 of the control system of the oven 1 (or eventually in the memory of the Personal Computer 10);
- closing the program being currently on displaying or editing program, without saving it (option "Close");
- 15 - saving the edited or modified program (option "Save"), to which a name is already associated to; such an option, as explained above, allows for saving a program only in the memory area ME3 or in the memory of the Personal Computer;
- saving the edited or modified program, by assigning to it a name being different from the original one (option "Save as");
- 20 - exiting the editor (option "Exit").

The zone II is instead destined to identify the program being displayed/edited on the editor, by means of the indication of its assigned number and the relevant alphanumerical name; in the specific instance shown in the figure, the program of interest is identified by the number "16" and the name "Roastbeef 1", respectively.

25 In the zone III the graphic representation is provided, on a Cartesian plane, of the various phases forming the operating cycle controlled by the program in course of display/editing, where the duration of the various phases (and then, globally, the duration of the entire cycle) is on the abscissa, and the temperature value of the cooking chamber of the oven 1.

to be reached and maintained during such phases, is on the ordinate.

Thus, the graph globally points out a curve being representative of the progress of the temperature during the entire operating cycle, or, in other words, the thermal profile of the cooking cycle.

- 5 In the above example, the cycle provides for four phases, being represented by the four rectangles marked 1, 2, 3, 4 (the information concerning the splitting of the operating cycle into the four steps pertains, as previously mentioned, to the contents of the memory area ME1).

For the selection of the phase to be modified, the computer keyboard can be used directly,  
10 or more simply positioning the pointer of a *mouse* in correspondence of the rectangle of interest, and clicking there.

In the case of Fig. 4, the phase 1 has been selected, i.e., the first rectangle from the left; this selection is highlighted by means of a thicker perimetric line of the rectangle.

Finally, the zone IV is used for the displaying and the possible modification of the  
15 parameters for the selected phase of the operating cycle.

In the example of Fig. 4, therefore, the zone IV represents the various parameters characterizing the step 1, previously selected in the zone III.

This zone IV reports in its upper portion the indication of the selected phase (1 - Preheating) and in the lower portion the "tools" for selecting and modifying the various  
20 parameters.

As it can be noticed in the figure, such parameters and the relevant instruments concern (from left to right):

- the phase time, which can be set by means of the mouse (rotating the symbol of an index selector), or directly through the keyboard (through specific keys, or placing the mouse  
25 pointer in a special field and inputting the requested value); this corresponds in a real time, in the zone III, to a change of the width of the corresponding rectangle; in the example, a duration of 40 minutes has been selected for the phase 1;
- the phase temperature, which can be set with in the same ways as for the above phase



time; consequently, in the zone III and in real time, a modification in the ordinate value of the segment of the temperature curve and of the relevant inclination within the corresponding rectangle will take place; in the example, a temperature of 120 Centigrades degrees has been selected for the phase I;

- 5 - the area, in the cooking chamber, where the heat sources to be used during the phase are located, where the possibility of selection is offered through option buttons, which can be actuated through the mouse and are associated to the upper are, the lower are and the central-rear are, respectively; the example of the figure shows that the upper are and the lower are have been selected, to which specific heat sources are associated depending on
- 10 the type of oven;
- the type of ventilation to be possibly used during the phase, with the possibility of choosing between "slow, normal, fast"; in the example, the ventilation is not activated (the symbols of the option buttons are not blackened);
- the mode of use of the grill, if desired, with the possibility of choosing between single
- 15 and double power, always through option buttons which can be actuated by the mouse; in the example, the double grill power has been selected.

It is clear that, in order to modify the operating parameters associated to the subsequent phases of the cycle (2, 3 and 4), the user only has to select the rectangle of interest in the zone III, with the consequent displaying of the modifiable parameters for that phase in the

20 zone IV.

Once all settings/modifications have been executed for the various phases of interest, the user can then proceed with the storing of the new program (for instance, by using the option "Save as" in the zone I), in the memory area ME3 of the control system of the oven.

- It will be appreciated that, by means of the editor described above, the possibility is also
- 25 offered for the user to suppress some of the phases into which the operating cycle of each program is subdivided, simply by setting its duration to a nil value.

At any rate, the editor program preferably provides for proper controls of the operations actuated by the user, in order to avoid wrong or improper programming, which could lead

to unsatisfactory results or performances (such as, in the instance of a laundry wash machine, setting a "new" wash program for woolens at a temperature of the washing liquid of 90°C!).

From a practical standpoint, the present invention operates as follows.

- 5 In its initial standard version, the oven 1 has a basic intelligence of its own, being encoded in the memory areas ME1 and ME2, which allows the household appliance to execute some standard programs, such as a number of seven, which cannot be modified by the user. In this situation, after switching the oven on through the switch 3 of the control panel 2, the display 6 shows the number and name and/or symbol of the first program being available in  
10 the memory area ME2; the user may then scroll sequentially the indications relating to the other six available programs on the display 6, by using the keys 5 (forward - backward).

Once the desired program has been reached, this can be started by pressing the key 7 (eventually, the user can modify the temperature value, if desired, actuating the selector 4).

The oven 1 then perform the operating cycle relating to the program that has been chosen.

- 15 As it can be seen, therefore, the oven 1 operates in its basic version according to classic procedures.

Should the user desire to add new cooking programs to the oven 1, a Personal Computer 10 (with its programs editor installed) shall be used, which can be interfaced directly to the oven control system through a suitable cable connected to the standard serial line RS232,  
20 or through a proper "home bus".

In this way, the user can generate his own cooking program through the editor, being designed according to his specific requirements, as described above.

Once the new program has been edited, the user saves it in the memory area ME3 of the control system of the oven 1, according to the procedures previously described.

- 25 Eventually, the editor can be provided with options which allows for executing the new program on the oven 1 under the direct control of the Personal Computer 10, i.e. simply using the control system of the appliance as a executor of the commands of the Personal Computer (therefore, the oven 1 operates as a simple peripheral controlled by the PC

itself); this, for instance, to allow the user to previously verify the efficiency of an operating cycle, before proceeding to a final storage of the relevant program in the memory area ME3.

To this effect, the user may also decide to save a new program in the mass storage of the  
5 Personal Computer, instead of saving it directly in the control system of the oven 1; it has to be noticed, anyway, that the editor is so designed for suitably guiding the user during the various saving options and that, as said above, the parameters relating to the new program can be saved for an unlimited time, until a likely subsequent modification or cancellation by the user takes place.

10 Once the new program has been stored in the control system of the oven 1, the program can then be selected directly through the control panel 2 of the appliance, through the keys 5 and display 6.

Accordingly, if in the basic version of the oven 1 only the identifying data of the seven basic programs could be sequentially displayed on the display 6, now also those data  
15 relating to the new programs can be displayed, which the user may add up to a maximum number admitted by the capacity of the memory area ME3.

Thus, once the new programs have been stored in ME3, they can be selected and started in the classic mode, i.e. using the normal means provided to that purposes on the oven 1, without requiring the Personal Computer 10.

20 It is also clear that the user will be free to cancel the new programs residing in the area ME3 of the memory of the control system of the oven, or those available in the mass storage of the Personal Computer 10.

From the above description, it is clear how the basic version of the oven according to the present invention can perform all the conventionally known functions associated with it  
25 and how its cost is practically not affected with respect to a conventional mid-level household appliance with an electronic control.

The same household appliance, once interfaced with the Personal Computer and by means of the relevant editor, can be improved in a cost-effective way, with a lot of new programs.

differing from the basic programs, whereby the user also has the possibility of:

- dynamically changing the configuration of the heating elements during the cooking process, which fact allows for achieving suitable temperature profiles relating to particular recipes;
- 5 - combining in an optimal way, in particular for the ovens having mixed cooking systems (such as infrared + microwaves), the cooking aids provided by each one of said systems, so as the user has no need to plan specific sequences of manual operations;
- configuring at will the sequence of operation the actuators of the oven (lower heater, upper heater, rear heater, grill, fan, etc.), without any manual operation.

10 Finally, it has to be noticed that the present invention, even if described with particular reference to a cooking oven, is clearly applicable to any other household appliance equipped with an electronic control system.

Therefore, from the above description the features of the present invention are clear, as also clear are its advantages.

15 The main advantage of the present invention, which represents its most significant element, is to the benefit of the user and refers to the possibility of creating in a simple way new operating programs, even if having a complex structure, for their storage in the appliance control system.

A second advantage for the user lays in the fact that the latter has the possibility of initially  
20 purchasing the basic version of the appliance, and then add new programs at a later time, only if desired and with an extremely limited cost.

It is evident, in fact, that if the user already have a Personal Computer (as it is quite common nowadays), the cost required for "increasing" the capacity of the control system of the oven 1 are minimal, since only the interface module is required; moreover, considering  
25 that most household appliances having an electronic control are normally provided with an interface for communicating with the external world (for technical service purposes), it is clear that the enrichment of the oven 1 can practically take place at a zero cost.

It is obvious that many changes are possible for the man skilled in the art to the

programming system described above by way of example, without departing from the novelty of the invention.

For instance, the possibility is cited of providing a specific customers' service, for supplying new programs to the appliance, or for creating new programs complying with the user's specific requirements or wishes, should the user have no Personal Computer

5 available in his/her home environment, or not wish to generate such programs directly.

In this case, an employee of said customers' service, will connect his own portable Personal Computer, having the editor described above, to the user's appliance for creating and/or adding the desired programs.

10 In a particularly advantageous embodiment of the present invention, the cited editor may be provided for allowing the user to download the new operating programs for the appliance from a remote systems, for their storing in the memory area Me3; obviously, such new programs can be stored in the control system of the oven 1 in their original form, or with modifications performed through the editor by the user himself.

15 To this purpose, and as represented in the example of Fig. 1, a standard telephone network RT can be used, through which the Personal Computer 10 equipped with a modem can perform a connection to a proper Internet site, where new programs for the appliance are made available, such as cooking programs for recipes prepared by famous cooks or, in the instance of a washing machine, programs specifically provided for the washing of specific

20 type of laundry or crockery.

Also the system described above, using a remote connection, may be used according to two procedures:

- downloading and adding to the appliance control system a new program, to be locally activated, i.e. through the controls panel 2 of the oven 1;
- 25 - executing the program on the oven 1, but under the control of the Personal Computer 10, i.e. by-passing at least partially the appliance control system and using the latter as a simple peripheral.

It is clear that the above Internet site may be updated at regular intervals, with new recipes

and relevant programs made available to the users of the household appliance, and it is also clear that the editor being present on the Personal Computer 10 may also be provided for the transmission to a remote address, through a telephone line, of files relating to programs created by the user (for example for a recipes exchange among various people).

- 5 In this situation, the editor will be provided to load in the memory of the Personal Computer 10 the programs contained in the memory area ME3 of the oven control system, and send them through the modem to other users, or to a special mailbox of the cited Interned site.

Another possible embodiment concerns the type of displaying of the parameters on the  
10 editor, which in addition or as an alternative to the graphic form, may be in a tabular form, listing the modifiable parameters for the various phases.

According to another possible embodiment, the editor may be provided for allowing the displaying in real time, on the video of the Personal Computer 10 (for example in a graphic form) of suitable information relating to the operating status of the appliance, such as the  
15 parameters identifying the progress status of a performed program; for instance, always with reference to a cooking oven, such data may concern the current temperature, the heat sources being active, the time spent since the start of the cooking, the estimation of the time needed to reach the end of the cooking, the estimation of the food cooking level, likely indications for users should their manual action be required, diagnostic signals for  
20 technical assistance, etc.

Similarly, the editor may be provided for allowing to program in time the execution of an operating cycle of the appliance.

The information relating to the subdivision into various phases of the operative cycles of the appliance, as well as the information relating to the specific parameters of the phases of  
25 the basic or standard cycles, may reside in read-only memory means (ROM) or directly in the program memory of the microcontroller MP; however, it is clear on the other hand that the information relating to the parameters characterizing the phases of the basic or standard cycles may also be contained within protected areas of read- write memory means.

**CLAIMS**

1. System for programming a household appliance (1) having an electronic control, of the type being able to execute a plurality of programs for the control of the realization of a group of treatment operations of the items onto which the action of the appliance (1) is directed, said appliance (1) having a control system comprising:

- 5     - a microcontroller (MP),
- memory means (ME1,ME2,M3) associated to said microcontroller (MP), wherein first information are stored before the manufacturing stage of the appliance has ended, said first information being used by the control system to execute a given number of first programs of the appliance (1), said first programs allowing the immediate use of the appliance (1) once the manufacturing of the same has been completed,
- 10    - means (IN) for interfacing said control system to external electronic programming devices (10),
- a control panel (2) residing on the appliance (1), for the selection and the control of the execution of said first programs,

15    characterized in that:

- a first part (ME1,ME2) of said memory means (ME1,ME2,M3) results in being write-protected after said first information have been stored therein during the manufacturing of the appliance,
- a second part (M3) of said memory means (ME1,ME2,M3) is provided for the storage of second information, once the appliance (1) has been marketed and/or or installed at a user's premises and by means of an external programming device (10), said second information allowing the control system to execute second programs which are additional and different with respect to said first programs,
- 20    - said control panel (2) residing on the appliance (1) allows for selecting and commanding the execution of said second programs in addition to said first programs,
- 25    where said second part (M3) of said memory means (ME1,ME2,M3) is of the writable and erasable type and said second information are encoded and stored therein for an undetermined time, until a possible subsequent modification or cancellation is carried out through said external programming device (10), at the user's desire.

30    2. System, according claim 1, characterized in that means are provided for preventing the storage within said second part (M3) of said memory means

3. System, according to the claim 1, characterized in that said first information relate to the subdivision of said programs into various treatment phases, where each one of said phases is in turn characterized by determined values of control parameters of internal devices or actuators (A1-A5) of the appliance.

5. System, according to claim 3, characterized in that at least a part said second information relates to the values of said control parameters characterizing the various phases into which said second programs are subdivided.

7. System, according to claim 1, characterized in that said first and/or second information comprise data for identifying in an univocal way a determined program which can be executed by the appliance (1).

9. System, according to claim 7, characterized in that the data identifying a program comprise a name in alphabetical and/or numerical and/or graphic characters.

11. System, according to claim 1, characterized in that said first part (ME1,ME2) of said memory means (M1,M2,M3) comprises at least a part of the program memory of said microcontroller (MP).

13. System, according to claim 1, characterized in that said second part (M3) of said memory means (M1, M2, M3) comprise a memory of the EEPROM type.



14. System, according claim 1, characterized in that said external programming device is a Personal Computer (10).

15. System, according to claim 1, characterized in that means are provided for executing, under the direct control of said external programming device (10), one of said  
5 second programs.

16. System, according to claim 1, characterized in that means are provided for using the control system of said appliance (1) as an executor of controls coming from said external programming device (10), said appliance (1) behaving like a simple peripheral connected to said external programming device (10).

10 17. Household appliance, for the use in the system according to one or more of claims 1 to 16, having an electronic control system comprising:

- a microcontroller (MP),
- first memory means (ME1, ME2), associated to said microcontroller (MP), being write-protected for inhibiting the modification of said first information relating to said first  
15 programs,
- second memory means (ME3), associated to said microcontroller (MP), being writable and erasable for allowing the storage, and/or the modification thereof, of said second information relating to said second programs,
- interface means (IN) for connecting said control system (MP, ME1, ME2, ME3) to said  
20 external programming device (10).
- a control panel (2) residing on the appliance (1), for the selection and the control of the execution of either said first programs and said second programs.

18. Household appliance, according to claim 17, characterized in that it is a cooking oven (1).

25 19. Household appliance, according to claim 17, characterized in that it is a washing machine.

20. Household appliance, according to claim 17, characterized in that said interface means (IN) comprise a serial port.

21. Household appliance, according claim 17, characterized in that said interface  
30 means (IN) comprise an adapter for connecting said control system to a home bus, in particular a power line carrier bus.

22. Household appliance, according claim 17, characterized in that said control

panel (2) comprises a display device (6).

23. Household appliance, according to claim 22, characterized in that means (5) are provided for enabling the sequential displaying on said display device (6) of data identifying said programs.

5 24. Method for programming a household appliance (1) having an electronic control system (MP,M1,M2,M3), of the type being able to execute a plurality of programs, comprising the step of:

- storing first information into said control system (MP,M1,M2,M3), during the manufacturing stage of the appliance (1), said first information being used by the control system (MP,M1,M2,M3) to control the execution of a given number of first programs of the appliance (1), said first programs allowing the immediate use of the appliance (1) once the manufacturing of the same has been completed,
- providing the appliance (1) with control means (2) which allow for the selection and the command of the execution of said first programs,

10 characterized in that the following steps are further provided:

- a) protecting said first information, for inhibiting their modification after they have been stored into said control system (MP,M1,M2,M3);
- b) after the appliance (1) has been marketed or installed at a user's premises, interfacing said control system (MP,M1,M2,M3) to an external programming device (10),
- 15 c) obtaining, through said external programming device (10), second information for allowing said control system (MP,M1,M2,M3) to execute second programs being different with respect to said first programs,
- d) storing said second information, by means of said external programming device (10), into said control system (MP,M1,M2,M3), for adding said second programs to said first programs,
- 20 e) selecting and commanding the execution of said second programs through said control means (2),
- f) modifying or deleting said second information, through said external programming device (10), should the necessity arise for the user.

25 25. Method, according to claim 24, comprising, at least after step b) has been carried out, the step of reading out said first and/or second information from said control system (MP,ME1,ME2,M3), by means of said external programming device (10).

- 5 -

26. Method, according to claim 25, characterized by

- modifying, by means of said external programming device (10), the first information read out,
- storing the relevant modified information within said control system (MP,M1,M2,ME3), pairing said modified information with identifying data which are different from the ones being assigned to the first program of origin.

27. Method, according to claim 24, characterized by, at least after step b) has been carried out, establishing a connection between said external programming device (10), and a remote system, in particular an Internet site, through a communication line (RT).

28. Method, according to claim 27, characterized by downloading said second information from said remote system, for their subsequent storage within said control system (MP,M1,M2,ME3), through said external programming device (10).

29. Method, according to claim 27, characterized by sending said second information to said remote system, through said external programming device (10)

30. Method, according to claim 29, characterized by loading said second information contained in said control system (MP,M1,M2,ME3) into a memory of said external programming device (10), and sending them to said remote system.

31. A programming user interface, for the use in the method according to one or more of claims 24 to 30, said user interface being included in said external programming device (10) and comprising

- display means (II,III,IV),
- means for editing said second programs,
- means for realizing the likely storage of the second information relating to the edited programs within said control system (MP,M1,M2,ME3),

said means for editing said second programs being programmed for displaying onto said display means (II,III,IV) the subdivision of a program to be edited into various treatment phases and the values, for each of said phases, of control parameters of internal devices or actuators (A1-A5) of the appliance (1).

32. User interface, according to claim 31, characterized in that said means for editing are programmed for displaying said control parameters in a graphic form onto said display means (II,III,IV).

33. User interface, according to claim 31, characterized in that said means for

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editing are programmed for entering and displaying onto said display means (II,III,IV) data identifying a selected program to be edited.

34. User interface, according to claim 31, characterized in that said means for editing comprises means for selecting a phase of interest among the phases into which a program to be edited is subdivided and/or displaying at least some of said control parameters relating to such a phase.

35. User interface, according to claim 31, characterized in that said means for editing comprises means for generating and representing a Cartesian plane onto said display means (II,III,IV), said Cartesian plane showing, on the abscissa, the duration of the various phases forming the program to be edited, and on the ordinates, another parameter relating to said phases, in particular a temperature value.

36. User interface, according to claim 31, characterized in that said means for editing comprises means for suppressing at least one of the phase into which the program to be edited is subdivided.

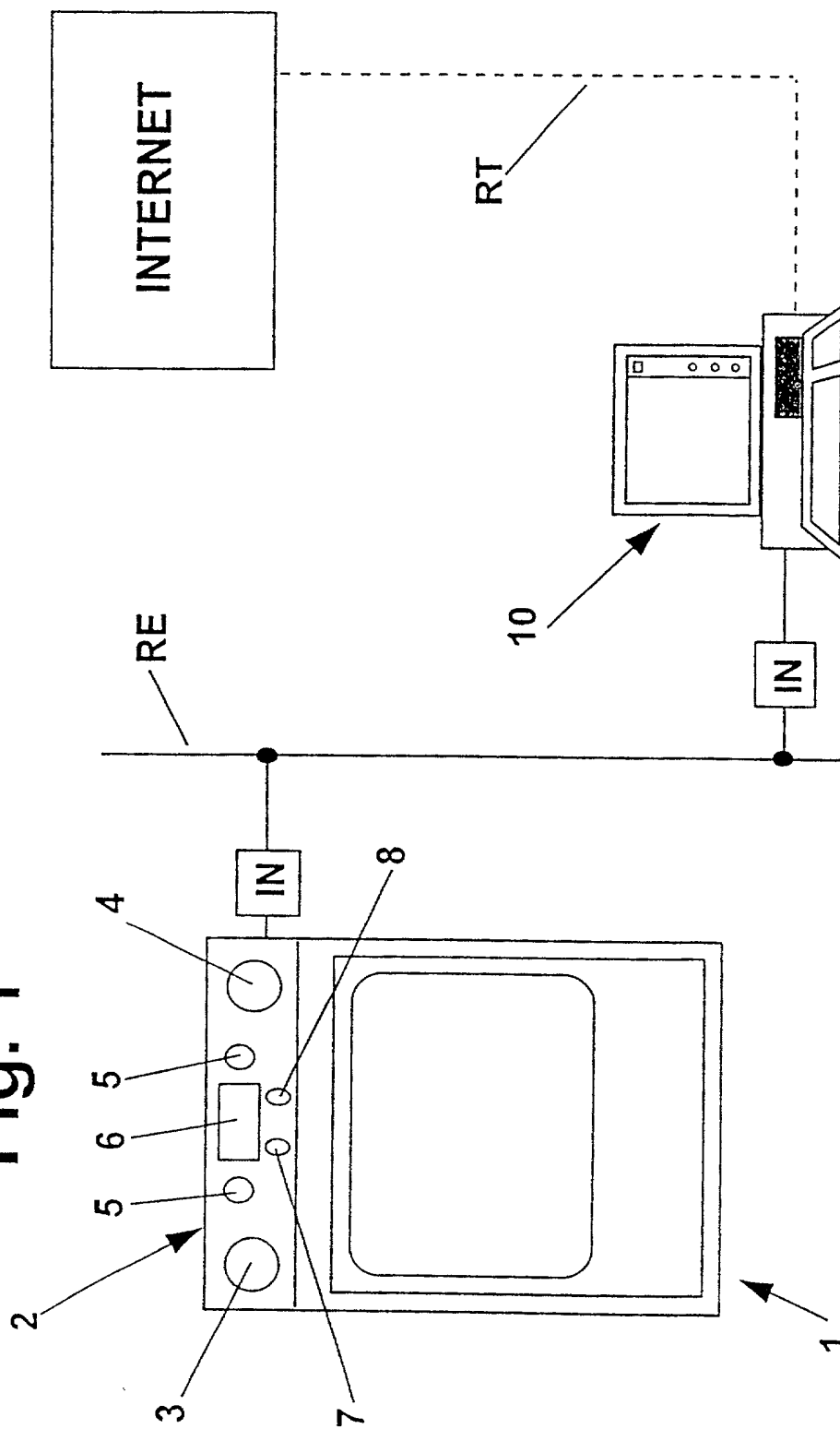
37. User interface, according to claim 31, characterized in that means are provided for displaying in a real time onto said display means (II,III,IV) information concerning the progress status of a program being running on said appliance (1).

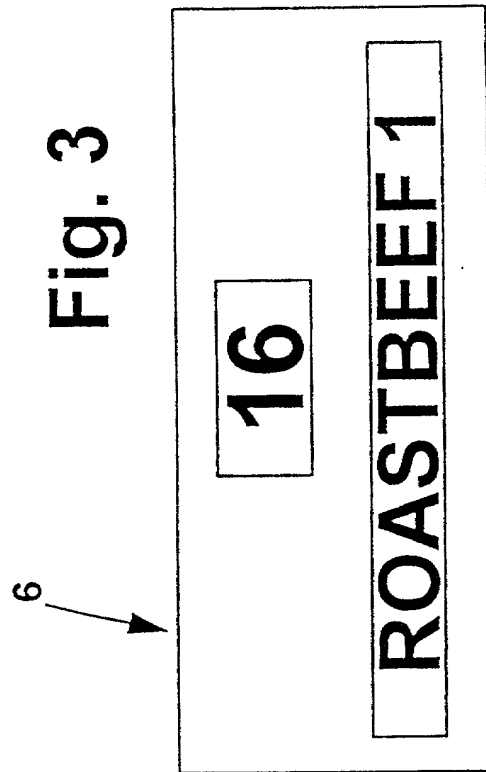
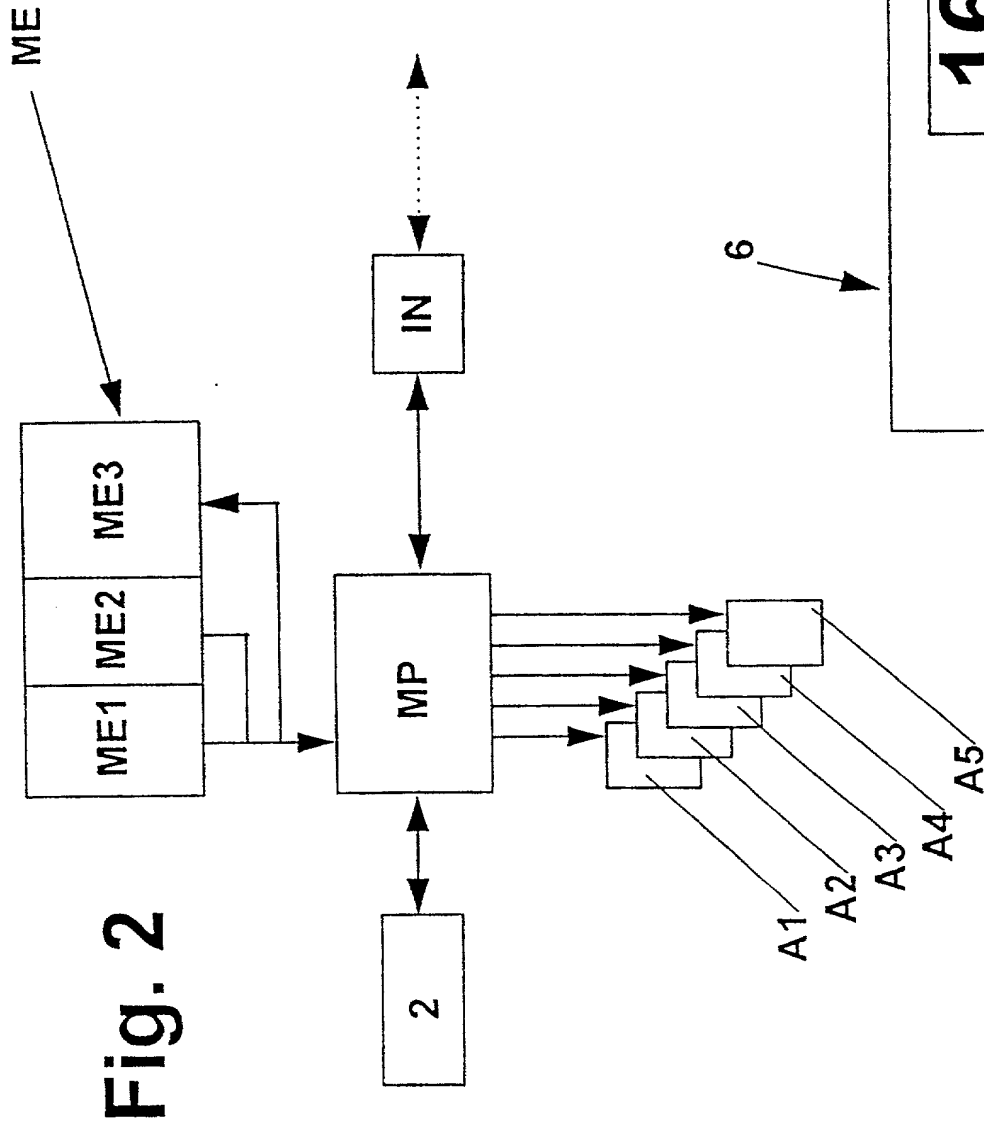
38. User interface, according to claim 31, characterized in that said program to be edited is a cooking program for a oven and said control parameters comprises:

- the duration of a selected phase, and/or
- the temperature to be reached within the oven during the selected phase, and/or
- the configuration and/or operating mode of heat sources of the oven (1), and/or
- the type of ventilation of possible use during the selected phase, and/or
- the modes of a possible use of a grill heater during the selected phase.

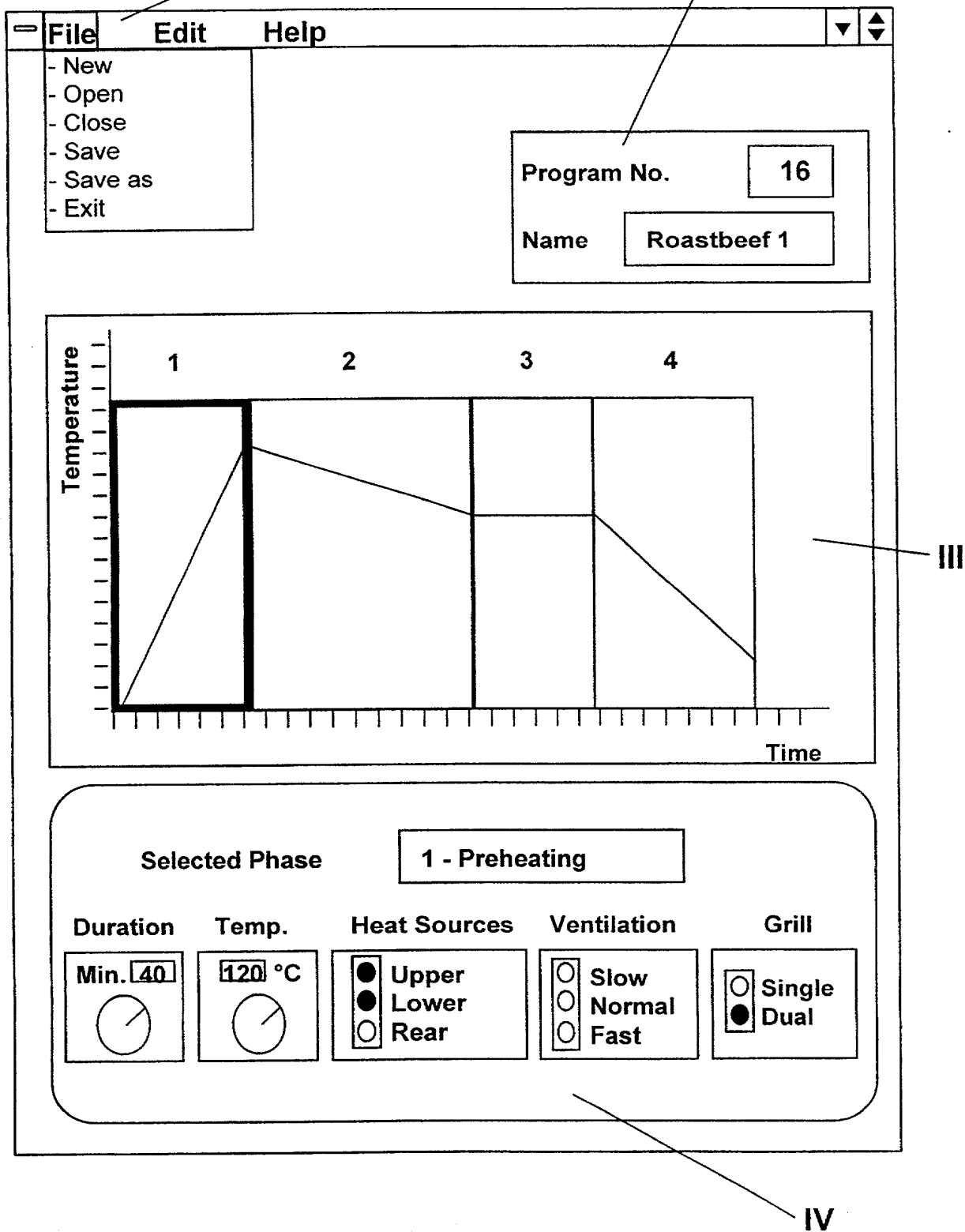
1/3

Fig. 1





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**Fig. 4**

## DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post-office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled SYSTEM FOR PROGRAMMING A HOUSEHOLD APPLIANCE HAVING AN ELECTRONIC CONTROL, described and claimed in PCT International Application No. PCT/IB99/01593, which international application was filed on September 29, 1999, designating the United States.

I hereby state that I have reviewed and understand the contents of the above-identified application specification, including the claims, as amended by any amendment specifically referred to herein.

I acknowledge the duty to disclose all information known to me that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me on the same subject matter having a filing date before that of the application on which priority is claimed: None.

I hereby claim the benefit under Title 35, United States Code §119(e) of the following U.S. provisional application: None.

I hereby claim the benefit under Title 35, United States Code §120, of the United States Application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United State Code, §112, I acknowledge the duty to disclose all information that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56, and which became available to me between the filing date of the prior application and the national or PCT international filing date of this application: None.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



18 I hereby appoint Michael E. Attaya, Reg. No. 31,731; Charles J. Barbas, Reg. No. 32,959; Joseph H. Born, Reg. No. 28,283; John L. Capone, Reg. No. 41,656; Robert A. Cesari, Reg. No. 18,381; Yong S. Choi, Reg. No. 43,324; Brian C. Dauphin, Reg. No. 40,983; Steven J. Frank, Reg. No. 33,497; Christopher K. Gagne, Reg. No. 36,142; A. Sidney Johnston, Reg. No. 29,548; William A. Loginov, Reg. No. 34,863; John F. McKenna, Reg. No. 20,912; Rama B. Nath, Reg. No. 27,072; Martin J. O'Donnell, Reg. No. 24,204; Thomas C. O'Konski, Reg. No. 26,320; Edwin H. Paul, Reg. No. 31,405; Michael R. Reinemann, Reg. No. 38,280; Rita M. Rooney, Reg. No. 30,585; Heather B. Shapiro, Reg. No. 41,305; Patricia A. Sheehan, Reg. No. 32,301; and Joseph Stecewycz, Reg. No. 34,442, Cesari and McKenna, LLP, 30 Rowes Wharf, Boston, Mass. 02110, jointly, and each of them severally, my attorneys and attorney, with full power of substitution, delegation and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent and to transact all business in the Patent and Trademark Office connected therewith. Please direct all telephone calls to Thomas C. O'Konski at (617) 951-2500. Please address all correspondence to Thomas C. O'Konski.

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